



UNITED STATES PATENT AND TRADEMARK OFFICE

TH
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,129	08/18/2003	Timothy Michael Edmund Frost	MARSP0170US	3518
43076	7590	03/19/2007	EXAMINER	
MARK D. SARALINO (GENERAL)			MEW, KEVIN D	
RENNER, OTTO, BOISSELLE & SKLAR, LLP			ART UNIT	PAPER NUMBER
1621 EUCLID AVENUE, NINETEENTH FLOOR				
CLEVELAND, OH 44115-2191			2616	
SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE		
3 MONTHS	03/19/2007	PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)
	10/643,129	FROST ET AL.
	Examiner	Art Unit
	Kevin Mew	2616

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 18 August 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-10 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-10 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 18 August 2003 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>8/18/03, 7/25/05</u> . | 6) <input type="checkbox"/> Other: _____ |

Detailed Action***Drawings***

1. Figures 1 and 2 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Furthermore, description legends that should be associated with each of the reference labels are missing in Figures 1-4 and 6.

Appropriate corrections are required.

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Particularly, in lines 5 and 6, the abstract should avoid using the form and legal phraseology often used in patent claims, such as "said." In addition, the title of the instant application as shown in the heading of the abstract should be removed from the abstract page.

Art Unit: 2616

The language should not repeat information given in the title, as described in the first paragraph, first line of the abstract. The reference numerals used in the abstract should also be removed.

Appropriate corrections are required.

Claim Objections

3. Claims 1, 7-8 are objected to because of the following informalities:

In line 8, claim 1, replace the term “synchronising” with the American English term “synchronizing.”

In line 2, claim 7, replace the term “synchronising” with the American English term “synchronizing” and in line 11, replace the term “synchronised” with the American English term “synchronized.”

In line 11, claim 8, replace the term “synchronising” with the American English term “synchronizing” and the term “analysing” with the American English term “analyzing.”

Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-5, 7-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Dudziak et al. (US Publication 2002/0136232 A1).

Regarding claim 1, Dudziak discloses a method of distributing timing information across a packet network (a method of distributing timing information across a Ethernet-based PON system, element 100, Fig. 1), the method comprising:

at a master component (at the central access module 106, comprising optical line terminal OLT 112, paragraph 0024, Fig. 1), generating timing signals at predictable intervals using a clock reference of a given frequency (generating telecom clocks based on a reference 8 kHz telecom clock, paragraphs 0032, 0034), and broadcasting or multicasting the timing signals to a plurality of client components over (the data transmission clock, which is distributed to the ONUs, paragraph 0035 and Fig. 1) said packet network (over Ethernet-based PON system 100, Fig. 1), preserving the timing signal intervals (timing information is embedded in the data transmission clock, paragraph 0035); and

at each said client component (optical network unit ONU, paragraph 0024 and element 114, Fig. 1), receiving said timing signals (receiving data transmission clock at the ONU, paragraph 0035) and determining the intervals between successive signals (determining two

phase-shifted clocks from the data transmission clock, paragraph 0035), applying a clock recovery algorithm to said determined intervals (using frequency divider on the two phase-shifted clocks) to recover in substantially real time the original clock frequency (to recover a ONU reference clock), and synchronizing the frequency of a local clock of the client component to the recovered frequency (synchronizing the telecom-related clock derived from the ONU reference clock with the telecom-based clock of the OLT, paragraph 0035).

Regarding claim 2, Dudziak discloses a method according to claim 1, the method being used to distribute timing information between various components of a telecommunication system coupled together via a packet network (distributing timing information between OLTs and ONUs via a Ethernet-based PON system, paragraphs 0034, 0035 and Fig. 1).

Regarding claim 3, Dudziak discloses a method according to claim 2, wherein said components include one or more components (ONUs) coupled to TDM networks/links (connected to T1 line via T1 interface, Fig. 5; note that T1 line is TDM digital transmission link).

Regarding claim 4, Dudziak discloses a method according to claim 1, wherein one or more of the components is coupled to a T1 or E1 (T1, paragraph 0034 and Fig. 1), T3 or E3 (T3, paragraph 0035, Fig. 1), SONET or SDH link, performing a data conversion function between the T1 or E1, T3 or E3, SONET or SDH data format and the packet network data format (performing data format conversion from T3 to T1, paragraphs 0034, 0035, Figs. 1 and 5).

Regarding claim 5, Dudziak discloses a method according to claim 1, the packet network providing a backplane of a telecommunications gateway (Ethernet-based PON system is the backplane of a telecom gateway between central office 102 and telephones 104, Fig. 1).

Regarding claim 7, Dudziak discloses apparatus for enabling the operating clock frequencies of a plurality of components (operating T1 clocks of ONUs, paragraph 0035 and Fig. 1), coupled to a packet network (coupled to Ethernet-based PNO system 100, Fig. 1), to be synchronized to the clock frequency of a master component (synchronized to the T3 clocks of the OLTs 112, paragraphs 0034, 0035 and Fig. 1) also coupled to the packet network (also coupled to Ethernet-based PNO system 100, Fig. 1), the apparatus comprising:

means (OLT 112, Fig. 1) at a master component (at the central access module 106, comprising optical line terminal OLT 112, paragraph 0024, Fig. 1), generating timing signals at predictable intervals using a clock reference of a given frequency (generating telecom clocks based on a reference 8 kHz telecom clock, paragraphs 0032, 0034), and broadcasting or multicasting the timing signals to a plurality of client components over (the data transmission clock, which is distributed to the ONUs, paragraph 0035 and Fig. 1) said packet network (over Ethernet-based PON system 100, Fig. 1), preserving the timing signal intervals (timing information is embedded in the data transmission clock, paragraph 0035); and

means (Gigabit Ethernet Transceiver 502, Fig. 5) at each said client component (at each optical network unit ONU, paragraph 0024 and element 114, Fig. 1), receiving said timing signals (receiving data transmission clock at the ONU, paragraph 0035) and determining the intervals between successive signals (determining two phase-shifted clocks from the data

transmission clock, paragraph 0035), applying a clock recovery algorithm to said determined intervals (using frequency divider on the two phase-shifted clocks) to recover in substantially real time the original clock frequency (to recover a ONU reference clock), and synchronizing the frequency of a local clock of the client component to the recovered frequency (synchronizing the telecom-related clock derived from the ONU reference clock with the telecom-based clock of the OLT, paragraph 0035).

Regarding claim 8, Dudziak discloses a gateway (Ethernet-based PON system 100, Fig. 1) of a telecommunications network, the gateway comprising:

a plurality of components each operating at a local clock frequency (ONUs operating at T1 clock, paragraph 0035, Figs. 1 and 5), one of the components, the master component (central access module 106, paragraph 0024 and Fig. 1), generating or receiving a reference clock signal having a given frequency (receiving a 8KHz telecom-based clock from central office 102, paragraph 0029 and Fig. 1); and

a packet network backplane (combiner/splitter 118, Fig. 1) for communicating packet data between said components (Ethernet-based PON system for communicating data streams between OLTs and ONUs, paragraphs 0034, 0035 and Fig. 1), the master component having means (at the central access module 106, comprising optical line terminal OLT 112, paragraph 0024, Fig. 1) for generating from said clock reference a stream of timing signals at predictable intervals (generating telecom clocks based on a reference 8 kHz telecom clock, paragraphs 0032, 0034), and means for broadcasting or multicasting said timing signals (OLTs for distributing data transmission clock, paragraph 0035), preserving the timing signal intervals (timing information

is embedded in the data transmission clock, paragraph 0035), to other components (the data transmission clock, which is distributed to the ONUs, paragraph 0035 and Fig. 1) operating at said local clock frequencies (operating at T1 clocks, paragraph 0035 and Fig. 5) via said packet network backplane (via combiner/splitter 118, Fig. 1), and the receiving components (ONUs 114, Fig. 1) having means (synchronizer 510, Fig. 5) for synchronizing their local clock frequencies to said reference clock frequency by analyzing the intervals between received timing signals (for synchronizing the telecom-related clock derived from the ONU reference clock to the telecom-based clock of the OLT by analyzing the two phase-shifted clocks of the received data transmission clock, paragraph 0035).

Regarding claim 9, Dudziak discloses a gateway according to claim 8, wherein at least one of said components is a TDM line card (ONU, element 114, Fig. 5), coupled in use to a TDM link (coupled to T1 line via T1 interface, paragraph 0035 and Fig. 5).

Regarding claim 10, Dudziak discloses a gateway according to claim 9, wherein at least one of the components is be a TDM line card (ONU, element 114, Figs. 1 and 5) coupled to a T1 or E1 link (coupled to T1 line via T1 interface, paragraph 0035 and Fig. 5) whilst at least one other component is a TDM line card (OLT, element 112, Fig. 1) coupled to a T3, E3, SONET or SDH link (coupled to DS3T link 108, Fig. 1), the gateway performing up and down conversions for data received and sent via the links (the Ethernet-based PON system performs upstream and downstream conversions between T3/DS3 and T1 links, paragraphs 0034, 0035, Figs. 1 and 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dudziak et al. in view of Chang (US Publication 2003/0020991 A1).

Regarding claim 6, Dudziak discloses all the aspects of claim 1 above. Dudziak also discloses a method according to claim 1, comprising including in packets containing a timing signal (data transmission clock, paragraph 0035).

Dudziak does not explicitly show a priority marker, upon recognition of such packets at routers/switches of the packet network, forwarding them with the highest possible priority.

However, Chang discloses an upstream frame in a PON system, which comprises a priority field (paragraphs 0040, 0041 and Fig. 6).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the method of synchronizing between OLTs and ONUs in a Ethernet-based PON system with the teaching of Chang in including a priority field in an upstream frame transmitted in a PON system such that the synchronization method of Dudziak will show a priority marker, upon recognition of such packets at routers/switches of the packet network, forwarding them with the highest possible priority.

The motivation to do so is to define the priority level of the data packets with respect to data traffic flow such that data packets with highest priority, such as voice data, will be transmitted first than image pictures with a lower priority.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Mew whose telephone number is 571-272-3141. The examiner can normally be reached on 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Seema S. Rao
SEEMA S. RAO 3/14/07
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

Kevin Mew *KM*
Work Group 2616